INDOOR AIR QUALITY INVESTIGATION

3101 Park Center Drive
Fourth Floor
Alexandria, Virginia 22309

Prepared for:

United States General Services Administration
Public Building Service, National Capital Region
301 7th Street, SW
Washington, D.C. 20407

Contract # GS11P07YAD0039
Order #
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November 26, 2007

Prepared by:

Jeffrey L. Amy
Indoor Air Quality Division Manager
Applied Environmental, Inc.

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SUMMARY

Applied Environmental, Inc. performed a limited Indoor Air Quality (IAQ) investigation on the fourth floor of the office building located at 3101 Park Center Drive in Alexandria, Virginia. The investigation was performed on November 9, 2007, and consisted of direct read measurements of temperature and relative humidity. Samples were also collected to measure airborne concentrations of bacteria and fungi. Selected components of the building's Heating, Ventilation, and Air-Conditioning (HVAC) system were inspected for cleanliness and proper operation.

Criteria used to evaluate the survey results include standards and guidelines referenced by the Occupational Safety and Health Administration (OSHA), the American Conference of Governmental Industrial Hygienists (ACGIH), the U.S. Environmental Protection Agency (EPA), the National Institute for Occupational Safety and Health (NIOSH), and other applicable industry guidelines.

Temperature and relative humidity measurements on the fourth floor of the office building located at 3101 Park Center Drive were within acceptable limits. Airborne bacterial and fungal concentrations were well below the levels considered to indicate significant microbial contamination. However, the airborne fungal concentration measured in Room 436 did exceed the outdoor concentration measured on the survey date. A minor contamination source in this area could be present.

Discolored gypsum board (drywall) was observed on lower portion of the east wall of Room 418 and the west wall of Room 436. Both rooms had been affected by a recent water release.

Paint damage was observed on the north wall of Room 418 and the south wall of Room 438, a room affected by a similar water release four to five months prior. The damage appeared to be superficial with no underlying drywall damage. A water damaged ceiling tile was also observed in Room 438. Ceiling tiles removed from water damage events had not been replaced in Rooms 418, 436, and 438. Complete recommendations are provided in the Conclusions and Recommendations Section of this report.

SITE HISTORY AND OBSERVATIONS

The fourth floor of the office building located at 3101 Park Center Drive is occupied by employees of the United States Department of Agriculture. The floor contains typical office space. Interior finishing materials include drywall walls, carpet or tile over concrete floors, and a suspended acoustical tile ceiling system.

Approximately 45 days prior to this survey, condensate water from a remote duct coil leaked from an underlying drain pan and entered Rooms 418 and 436. Room 418 is a file room with a tile floor, and Room 436 is a shredder room with a carpeted floor. Approximately one month ago, an employee occupying Cubicle 457, located northeast of Room 418, initially reported development of respiratory symptoms. The occupant was not present during the survey

Severe paint damage extending from floor to ceiling was observed on the north wall of Room 418 near the northwest corner. The damage appeared to be superficial and the underlying drywall undamaged. Discolored drywall was observed just above the vinyl cove base on the west wall near the northwest corner. Low moisture content was measured in all tested drywall. Damaged ceiling tiles had been removed, but not replaced. No damage to floor tile was observed.

In Room 436, only minor water streaks and paint damage were observed on the east wall near the northeast corner. Discolored drywall was visible on the east wall to a height of approximately one foot above the floor, extending from the northeast corner south for approximately two and one-half feet. Low moisture content was measured in all tested drywall. Carpeting in the room appeared to be in good condition and emitted no odor. No water damage was observed above the suspended ceiling of this or the previous space.

No water damaged materials were observed either above or below the suspended ceiling at Cubicle 457. Carpeting in this area was worn, but appeared clean and emitted no odor.

Severe paint damage extending from floor to ceiling was observed on the south wall of Room 438. This interior office was affected by a similar water release from a duct coil condensate drain pan approximately four to five months prior to the survey. The space is currently unoccupied. The damage again appeared to be superficial, with the underlying drywall undamaged. Low moisture content was measured in all tested drywall. One water damaged ceiling tile remained at the south wall directly above the area of paint damage. Several damaged ceiling tiles had been removed, but not replaced. No water damage was observed above the suspended ceiling, or to office carpeting.

The fourth floor of the building appears to be used for typical administrative duties. No chemicals or hazards to occupants, other than those typically found in office environments, were observed.

SURVEY METHODOLOGY

Few legally enforceable standards exist governing the acceptable levels of airborne pollutants or other contaminants within a non-industrial building. Typically, interpretation of air sampling data obtained in IAQ evaluations is based on the guidelines and recommendations that have been developed for an indoor environment by various recognized technical associations and groups. These include the ACGIH, NIOSH, American Society of Heating, Refrigerating & Air Conditioning Engineers (ASHRAE), and the American Industrial Hygiene Association (AIHA).

Direct Read Measurements

The IAQ measurements were made with a portable air quality monitor manufactured by Metrosonics, Inc. The Metrosonics unit measures ambient temperature with a usable range of 32°F to 140°F, with an accuracy of ±0.9°F. Ambient relative humidity is measured from 0% to 100% relative humidity, with an accuracy of ±3% at 25°C.

Microbial Sampling

Microbial air sampling was performed to measure ambient viable microbial concentrations, and included control samples collected outside of the building for comparison purposes. The microbial air samples were collected using an SAS single-stage viable impactor, manufactured by pbi, Inc. The unit was pre-calibrated to collect 100 liters of air. Ambient air is drawn through the sampler and impacted onto plates containing appropriate growth media for culturing. Trypticase-soy agar media was used for bacterial samples, and malt extract agar for fungal samples.

All samples for airborne viable bacteria and fungi were collected using a modified NIOSH Analytical Method 800 in accordance with protocols recognized by the ACGIH. The samples were enumerated and identified using standard isolation and identification techniques. Sample results are provided as total counts of colony forming units (cfu) per sample volume, and were analyzed to identify the predominant species of microorganisms present, and the percent concentrations of those microorganisms in the total count.

All microbial samples were analyzed by Aerobiology Laboratory Associates, Inc., of Dulles, Virginia. Aerobiology Laboratory Associates participates in the AIHA Environmental Microbiology Proficiency Analytical Testing Program.

SURVEY FINDINGS

A discussion of each sampling parameter and the results are presented below. A data table indicating the locations of the direct read measurements and the results is included as Appendix A.

Temperature and Relative Humidity

The standard, *ASHRAE 55-1981, Thermal Environmental Conditions for Human Occupancy*, recommends that indoor temperatures be maintained between 73°F and 79°F during the summer/transitional season, and between 68°F and 74°F during the winter/transitional season, with relative humidity between 30% and 60%. These values are considered acceptable ranges of operative temperature and humidity for persons wearing typical light clothing and engaged in light activity, such as in a typical office setting. The standard is considered to be met if 80% of the building occupants are satisfied.

The ideal comfortable relative humidity range has been reported by ASHRAE to be 40% to 60%, as long as building materials or contents are not adversely affected. OSHA recommends humidity control within a 20% to 60% range in their technical manual for IAQ investigations. Low relative humidity can result in eye irritation and complaints of nose and throat discomfort. In addition, irritated mucous membranes can predispose susceptible individuals to the affects of certain chemical and microbiological air contaminants. High humidity levels (over 70%) can promote the growth of microorganisms on building surfaces and furnishings, and cause or contribute to microbial IAQ problems.

Temperatures measured during the survey ranged from 71.2°F to 72.7°F, and were within the ASHRAE recommended comfort range for the winter and transitional months, as well as the comfort range referenced in the OSHA Technical Manual in all locations. Relative humidity ranged from 25.9% to 28.4%, and was below the ASHRAE recommended comfort range in all locations. However, relative humidity was within the OSHA recommended comfort range in all locations. Diminished relative humidity is common in office buildings in the Washington, D.C. metropolitan area during the winter heating season. Outdoor temperatures on the day of the survey ranged from 42.6°F to 45.2°F with relative humidity ranging from 74.3% to 77.1%.

Microbial - General Guidelines

The ACGIH's, *Bioaerosols, Assessment and Control, 1999,* provides guidance on investigation, sampling, assessment, and remedial actions. This document identifies microorganisms currently associated with Building Related Illness, but does not provide any criteria for acceptable airborne concentrations or surface contamination levels. Emphasis is placed on identification of species, conditions found at the site, and symptoms reported by the affected individuals. "ACGIH does not support any existing numerical criteria for interpreting data on biological agents from source or air samples in non-manufacturing environments."

There are no federal OSHA standards regulating exposure to microorganisms in the workplace. The OSHA *Technical Manual, Chapter 6 - Indoor Air Quality Investigation, issued by OSHA Instruction CPL-2-2.20B, CH-1, November 13, 1990*, provides a value of 1,000 viable cfu per cubic meter of air (cfu/m^3) as an indicator of indoor contamination.

According to the EPA document, *Indoor Air - Assessment, Indoor Biological Pollutants, EPA 600/8-91/202,* bacteria and fungi require suitable elements for sustained growth, including a food source, proper temperature, humidity and light conditions, and oxygen availability or lack of oxygen. The presence of bacteria or fungi should not be alarming, since many types of bacteria and fungi are normally present in the outdoor environment, inside buildings, and in conjunction with healthy human beings.

Adverse health effects associated with exposure to microbial organisms are a function of many factors, of which concentration and the type of organism are major considerations. In most cases where the airborne concentration of viable microbes is low, adverse health consequences of exposure to bioaerosols are observed only in hypersensitive individuals, such as persons with known allergy histories, or in individuals with compromised immune systems. When present, the reactions of such individuals tend to become more severe with increasing exposures.

The potential for transmittal of an infectious microorganism in the air is dependent upon the presence of the organism in the environment and its airborne presence in sufficient concentrations. It must also remain viable for a sufficient duration to be able to come in contact with a susceptible human host. Persons with suppressed immune systems or allergies are particularly susceptible to the effects of microorganisms in the indoor environment.

In assessing potential microbial exposures, it is important to note that individual microbial measurements provide a limited view of true exposure, since levels can fluctuate widely over time and under varying conditions. Dead cells and cell fragments, proteins, metabolites and volatile organic compounds produced by microbes, may also be responsible for adverse health effects.

Microbial Sampling Results

The results of the microbial sampling performed are presented in the following table. The table includes the sampling locations, the concentrations of fungi and bacteria measured, and identification of the predominant organisms isolated.

Sample Number & Location	Sample Type	Result	Organisms Isolated
JH071109-01 4th floor, interior office room 436	Fungi, air w/ID Bacteria, air w/ID	107 cfu/m^3 96 cfu/m^3	Aspergillus ustus (100%) Bacillus species (11%) Coagulase-negative Staphylococcus (11%) Micrococcus species (78%)
JH071109-02 4th floor, cubicle area cubicle 457	Fungi, air w/ID Bacteria, air w/ID	<10 cfu/m^3 85 cfu/m^3	No growth Coagulase-negative Staphylococcus (62%) Micrococcus species (38%)
JH071109-03 4th floor, cubicle area cubicle 474	Fungi, air w/ID Bacteria, air w/ID	<10 cfu/m^3 75 cfu/m^3	No growth Coagulase-negative Staphylococcus (29%) Micrococcus species (71%)

Sample Number & Location	Sample Type	Result	Organisms Isolated
JH071109-04 4th floor, cubicle area near room 404	Fungi, air w/ID Bacteria, air w/ID	<10 cfu/m^3 21 cfu/m^3	No growth Micrococcus species (100%)
JH071109-05 Outdoor	Fungi, air w/ID Bacteria, air w/ID	53 cfu/m^3 32 cfu/m^3	Cladosporium species (60%) Drechslera/Bipolaris group (20%) Penicillium species (20%) Bacillus species (33%) Coagulase-negative Staphylococcus (33%) Micrococcus species (33%)
JH071109-06 Field blank	Fungi, air w/ID Bacteria, air w/ID	N/A	No growth

Indoor airborne viable bacterial and fungal concentrations were low. Airborne fungal concentrations were also well below the concentration measured outdoors in all but one location. The microbial concentrations measured in all locations would not suggest the presence of significant bacterial or fungal contamination sources in the areas tested. Airborne bacteria and fungi in the concentrations measured would not be anticipated to adversely affect normal healthy individuals.

The airborne fungal concentration measured in Room 436, the space affected by the most recent water release, was approximately twice the amount measured outdoors. *Aspergillus ustus* species fungi represented 100 percent of the sample. *Aspergillus* species fungi, while common in outdoor air, are known to thrive in wet conditions and water damaged materials. The presence of this organism, not identified in the outdoor air sample, could suggest an amplification source is present. However, the concentration measured does not suggest that a significant contamination source is present.

The laboratory report is presented in Appendix B

CONCLUSIONS AND RECOMMENDATIONS

The results of this survey indicate that temperature and relative humidity measurements on the fourth floor were within acceptable limits. Airborne bacterial and fungal concentrations were low and fungal concentrations were well below the concentration measured outdoors in all but one location. The airborne fungal concentration measured in Room 436 did exceed the outdoor concentration measured on the survey date, but the concentration measured does not suggest a significant contamination source is present.

Discolored drywall was observed just above the vinyl cove base on the east wall of Room 418 and west wall of Room 436. The appearance of the drywall suggested that microbial growth could be affecting the material.

Severe paint damage was observed on the north wall of Room 418 and the south wall of Room 438. Both rooms have been affected by water releases from condensate drain pans below remote duct coils. The damage appeared to be superficial, with no underlying drywall damage.

Low moisture content was measured in all tested drywall during the assessment.

Finally, a water damaged ceiling tile was observed in Room 438 at the south wall. Additionally, ceiling tiles damaged by water releases in Rooms 418, 436, and 438 had been removed, but not replaced.

Based upon the sampling results and upon observations made while on-site, the following recommendations are provided:

1. It would be prudent to remove discolored drywall to evaluate the condition of the material. Applied Environmental recommends that drywall be removed to a height of four feet (from the floor) extending from the northwest corner of Room 436 to a distance of four feet. Once removed, the unfinished side of drywall in Room 418 (west wall) can be evaluated. If microbial growth is observed on this surface, this material should be removed as well.

2. Damaged paint in Rooms 418 and 438 should be removed from the surface of the drywall. If the underlying drywall is undamaged, it should be covered with an appropriate mildew resistant coating before finishing.

3. The water stained ceiling tile in Room 438 should be removed and replaced.

4. All missing ceiling tiles should be replaced. Missing ceiling tiles could affect the pressurization of the return air ceiling plenum and therefore, the efficiency of the HVAC system.

APPENDIX A

Direct Read Monitoring Results

applied environmental inc.

General Services Administration
3101 Park Center Drive
Alexandria, Virginia

DIRECT READ RESULTS

Sampling Location	Time	Carbon Dioxide CO_2 (ppm)	Relative Humidity (%)	Temperature (°F)	Carbon Monoxide CO (ppm)	Respirable Particulate ($\mu g/m^3$)
Outdoors	8:54 a.m. 12:00 p.m.	-- --	74.3 77.1	42.6 45.2	-- --	-- --
4th floor, interior office, room 436	9:21 a.m. 12:05 p.m.	-- --	26.3 28.4	71.9 71.5	-- --	-- --
4th floor, interior office, room 438	9:24 a.m. 12:08 p.m.	-- --	26.0 28.4	71.4 71.2	-- --	-- --
4th floor, cubicle area, cubicle 480	9:27 a.m. 12:11 p.m.	-- --	26.2 28.0	72.3 71.7	-- --	-- --
4th floor, cubicle area, cubicle 470	9:30 a.m. 12:14 p.m.	-- --	26.0 27.8	72.1 71.9	-- --	-- --
4th floor, cubicle area, cubicle 457	9:33 a.m. 12:17 p.m.	-- --	26.0 27.8	72.0 72.0	-- --	-- --
4th floor, cubicle area, NE corner building	9:36 a.m. 12:20 p.m.	-- --	26.3 27.9	71.9 72.2	-- --	-- --
4th floor, cubicle area, cubicle 419	9:39 a.m. 12:23 p.m.	-- --	25.9 27.6	72.7 72.6	-- --	-- --
4th floor, cubicle area, cubicle 492	9:41 a.m. 12:26 p.m.	-- --	26.3 27.2	71.9 72.5	-- --	-- --
4th floor, cubicle area, cubicle 486	9:44 a.m. 2:29 p.m.	-- --	26.0 27.3	72.4 72.6	-- --	-- --

ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter

1046-07-G027/1

APPENDIX B

Laboratory Results

AEROBIOLOGY LABORATORY ASSOCIATES, INCORPORATED
MICROBIOLOGY SPECIALISTS

Dulles, VA 20166, 43760 Trade Center Place, Suite 100,
Phone (877) 648-9150 Fax (703) 648-3919 Email: lab@aerobiology.net
Atlanta, GA 30339, 4501 Circle 75 Parkway, Ste A1190
Phone (770) 947-2828 Fax (770) 947-2938 Email: ATL@aerobiology.net
St. Peters, Missouri 63376, 105 Olympic Way
Phone (636) 447-9021 Fax (636) 447-8376 Email: STL@aerobiology.net

Certificate of Laboratory Analysis

Applied Environmental, Inc.
200 Fairbrook Drive
Herndon, VA 20170
Attn: Jerry Humphrey
Project: 1046-07-G027/3101 Park Center Drive
Condition of Sample(s) Upon Receipt: Acceptable

Date Received: 11/9/2007
Date Reported: 11/14/2007
Page 1 of 7
Job ID: 75859

Client Sample Number: JH071109-01
Sampling Location: Room 436
Air Volume: 100(L)
Positive Hole: 219
Test Requested: 1030 Total FUNGAL Count w/ Identifications

Lab Sample Number: 75859-001
Date Collected: 11/9/2007
Date Analyzed: 11/14/2007
Min. Reporting Limit: $_{1B}$ 10

Positive Hole Corrected Total Count$_8$ **107 cfu/M^3**

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
Aspergillus ustus	10	100	100
Totals	10	100	~100%

Comments:
*See "Footnotes and Additional Report Information" section for explanation of footnotes.

Client Sample Number: JH071109-01
Sampling Location: Room 436
Air Volume: 100(L)
Positive Hole: 219
Test Requested: 1005 Total BACTERIAL Count w/ Identifications

Lab Sample Number: 75859-001
Date Collected: 11/9/2007
Date Analyzed: 11/12/2007
Min. Reporting Limit: $_{1B}$ 10

Positive Hole Corrected Total Count$_8$ **96 cfu/M^3**

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
Bacillus species	1	10	11
Coag-negative Staphylococcus species	1	10	11
Micrococcus species	7	70	78
Totals	9	90	~100%

Comments:
*See "Footnotes and Additional Report Information" section for explanation of footnotes.

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Date Reported: 11/14/2007
Page 2 of 7
Job ID: 75859

Client Sample Number: JH071109-02
Sampling Location: Cubicle 457
Air Volume: 100(L)
Positive Hole: 219
Test Requested: 1030 Total FUNGAL Count w/ Identifications

Lab Sample Number: 75859-002
Date Collected: 11/9/2007
Date Analyzed: 11/14/2007
Min. Reporting Limit:$_{1B}$ 10

Positive Hole Corrected Total Count$_8$ **< 10 cfu/M^3**

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
No growth	0	0	100
Totals	0	< 10	~100%

Comments:
*See "Footnotes and Additional Report Information" section for explanation of footnotes.

Client Sample Number: JH071109-02
Sampling Location: Cubicle 457
Air Volume: 100(L)
Positive Hole: 219
Test Requested: 1005 Total BACTERIAL Count w/ Identifications

Lab Sample Number: 75859-002
Date Collected: 11/9/2007
Date Analyzed: 11/12/2007
Min. Reporting Limit:$_{1B}$ 10

Positive Hole Corrected Total Count$_8$ **85 cfu/M^3**

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
Coag-negative Staphylococcus species	5	50	62
Micrococcus species	3	30	38
Totals	8	80	~100%

Comments:
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Page 3 of 7
Job ID: 75859

Client Sample Number: JH071109-03
Sampling Location: Cubicle 474
Air Volume: 100(L)
Positive Hole: 219
Test Requested: 1030 Total FUNGAL Count w/ Identifications

Lab Sample Number: 75859-003
Date Collected: 11/9/2007
Date Analyzed: 11/14/2007
Min. Reporting Limit:$_{1B}$ 10

Positive Hole Corrected Total Count$_8$ **< 10 cfu/M^3**

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
No growth	0	0	100
Totals	0	< 10	~100%

Comments:
*See "Footnotes and Additional Report Information" section for explanation of footnotes.

Client Sample Number: JH071109-03
Sampling Location: Cubicle 474
Air Volume: 100(L)
Positive Hole: 219
Test Requested: 1005 Total BACTERIAL Count w/ Identifications

Lab Sample Number: 75859-003
Date Collected: 11/9/2007
Date Analyzed: 11/12/2007
Min. Reporting Limit:$_{1B}$ 10

Positive Hole Corrected Total Count$_8$ **75 cfu/M^3**

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
Coag-negative Staphylococcus species	2	20	29
Micrococcus species	5	50	71
Totals	7	70	~100%

Comments:
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Date Received: 11/9/2007
Date Reported: 11/14/2007

Job ID: 75859

Client Sample Number: JH071109-04
Sampling Location: Cubicle Near Room 404
Air Volume: 100(L)
Positive Hole: 219
Test Requested: 1030 Total FUNGAL Count w/ Identifications

Lab Sample Number: 75859-004
Date Collected: 11/9/2007
Date Analyzed: 11/14/2007
Min. Reporting Limit:$_{1B}$ 10

Positive Hole Corrected Total Count$_8$ **< 10 cfu/M^3**

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
No growth	0	0	100
Totals	0	< 10	~100%

Comments:
*See "Footnotes and Additional Report Information" section for explanation of footnotes.

Client Sample Number: JH071109-04
Sampling Location: Cubicle Near Room 404
Air Volume: 100(L)
Positive Hole: 219
Test Requested: 1005 Total BACTERIAL Count w/ Identifications

Lab Sample Number: 75859-004
Date Collected: 11/9/2007
Date Analyzed: 11/12/2007
Min. Reporting Limit:$_{1B}$ 10

Positive Hole Corrected Total Count$_8$ **21 cfu/M^3**

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
Micrococcus species	2	20	100
Totals	2	20	~100%

Comments:
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Date Received: 11/9/2007
Date Reported: 11/14/2007

Job ID: 75859

Client Sample Number: JH071109-05
Sampling Location: Outdoors
Air Volume: 100(L)
Positive Hole: 219
Test Requested: 1030 Total FUNGAL Count w/ Identifications

Lab Sample Number: 75859-005
Date Collected: 11/9/2007
Date Analyzed: 11/14/2007
Min. Reporting Limit:$_{1B}$ 10

Positive Hole Corrected Total Count$_8$ **53 cfu/M^3**

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
Cladosporium species	3	30	60
Drechslera/Bipolaris group	1	10	20
Penicillium species	1	10	20
Totals	5	50	~100%

Comments:
*See "Footnotes and Additional Report Information" section for explanation of footnotes.

Client Sample Number: JH071109-05
Sampling Location: Outdoors
Air Volume: 100(L)
Positive Hole: 219
Test Requested: 1005 Total BACTERIAL Count w/ Identifications

Lab Sample Number: 75859-005
Date Collected: 11/9/2007
Date Analyzed: 11/12/2007
Min. Reporting Limit:$_{1B}$ 10

Positive Hole Corrected Total Count$_8$ **32 cfu/M^3**

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
Bacillus species	1	10	33
Coag-negative Staphylococcus species	1	10	33
Micrococcus species	1	10	33
Totals	3	30	~100%

Comments:
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Date Reported: 11/14/2007

Job ID: 75859

Client Sample Number: JH071109-06
Sampling Location: Field Blank
Air Volume: 0(L)
Positive Hole: 219
Test Requested: 1030 Total FUNGAL Count w/ Identifications

Lab Sample Number: 75859-006
Date Collected: 11/9/2007
Date Analyzed: 11/14/2007
Min. Reporting Limit:$_{1B}$ 0

Positive Hole Corrected Total Count$_8$ < 0 cfu/M^3

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
No growth	0	0	100
Totals	0	< 0	~100%

Comments:
*See "Footnotes and Additional Report Information" section for explanation of footnotes.

Client Sample Number: JH071109-06
Sampling Location: Field Blank
Air Volume: 0(L)
Positive Hole: 219
Test Requested: 1005 Total BACTERIAL Count w/ Identifications

Lab Sample Number: 75859-006
Date Collected: 11/9/2007
Date Analyzed: 11/12/2007
Min. Reporting Limit:$_{1B}$ 0

Positive Hole Corrected Total Count$_8$ < 0 cfu/M^3

Organism Isolated	Raw Count	Count/M^3	% Total$_9$
No growth	0	0	100
Totals	0	< 0	~100%

Comments:
*See "Footnotes and Additional Report Information" section for explanation of footnotes.

AEROBIOLOGY LABORATORY ASSOCIATES, INCORPORATED
MICROBIOLOGY SPECIALISTS

Dulles, VA 20166, 43760 Trade Center Place, Suite 100,
Phone (877) 648-9150 Fax (703) 648-3919 Email: lab@aerobiology.net
Atlanta, GA 30339, 4501 Circle 75 Parkway, Ste A1190
Phone (770) 947-2828 Fax (770) 947-2938 Email: ATL@aerobiology.net
St. Peters, Missouri 63376, 105 Olympic Way
Phone (636) 447-9021 Fax (636) 447-8376 Email: STL@aerobiology.net

Certificate of Laboratory Analysis

Applied Environmental, Inc.
200 Fairbrook Drive
Herndon, VA 20170
Attn: Jerry Humphrey
Project: 1046-07-G027/3101 Park Center Drive
Condition of Sample(s) Upon Receipt: Acceptable

Date Received: 11/9/2007
Date Reported: 11/14/2007

Job ID: 75859

Footnotes and Additional Report Information

1A: Minimum Reporting Limits (MRL) for SPORE TRAP samples are particle/spore specific. This factor is based on the air volume and the percent of the slide read.

1B: Minimum Reporting Limits (MRL) for CULTURABLE AIR samples are 1000 divided by the sample volume. It is a conversion factor to convert cfu/sample voume into cfu/M^3.

1C: Minimum Reporting Limits (MRL) for BULKS, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.

2: *Penicillium/Aspergillus* group spores are characterized by their small size, round to ovoid shape, being unicellular and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the *Penicillium/Aspergillus* type. Two common examples would be *Paecilomyces* and *Wallemia*. Although the majority of spores placed in this group are *Penicillium*, *Aspergillus*, or a combination of both, keep in mind that these are not the only two possibilities.

3: Basidiospores are typically blown indoors from the outdoors and rarely have an indoor source. However, in certain rare situations a high basidiospore count indoors can be indicative of a wood decay problem or wet soil.

4: The Smut, *Periconia*, myxomycete group is a group composed of three different types of organisms whose spores have similar morphologies. Smuts are plant pathogens, Periconia is a relatively uncommon mold indoors and myxomycetes are not fungi, but slime molds. Altough these organisms do not typically proliferate indoors their spores are potentially allergenic.

5: The colorless spores group contains colorless spores which were unidentifiable to a specific genus. Example of this group include *Acremonium*, *Aphanocladium*, *Beauveria*, *Chrysosporium*, *Engyodontium*, *Fusarium* microconidia, some arthrospores as well as many others.

6: Rusts are plant pathogens. Although these fungi do not typically proliterate indoors unless an infected plant is present, their spores are potentially allergenic.

7: Hyphae are the tubular filaments of fungi. They can break apart and become airborne much like spores and are potentially allergenic.

8: The positive-hole correction factor is a statistical tool which calculates a probable count from the total raw count, taking into consideration that multiple particles can impact on the same hole. For this reason the sum of the calculated counts may be less than the positive hole corrected total. When raw counts reach 95% of the positive hole value corrected counts should be considered an estimation.

9: Due to rounding totals my not equal 100%.

Terminology Used in Direct Exam Reporting

Hyphae are the tubular filaments of the fungi. Their presence on surface samples in high concentrations is indicative of growth.

Conidiophores are a type of modified hyphae from which spores are born. Their presence on surface samples in high concentrations is indicative of growth.

Perithecial elements are intact or fragmented spore producing bodies produced by some ascomycetes such as Chaetomium and Ascotricha. Their presence on surface samples in high concentrations is indicative of growth.

Pycnidial elements are intact or fragmented spore producing bodies produced by some coelomycetes like Phoma. Their presence on surface samples in high concentrations is indicative of growth.

Excel exports of our reports can be downloaded from our website for your convenience. Excel exports to not constitute a Certificate of Laboratory Analysis.
Results relate only to the items tested.

(b) (6) [redacted]

Suzanne S. Blevins, B.S., SM(ASCP)
Laboratory Director